Floodplain Wetlands: In Depth

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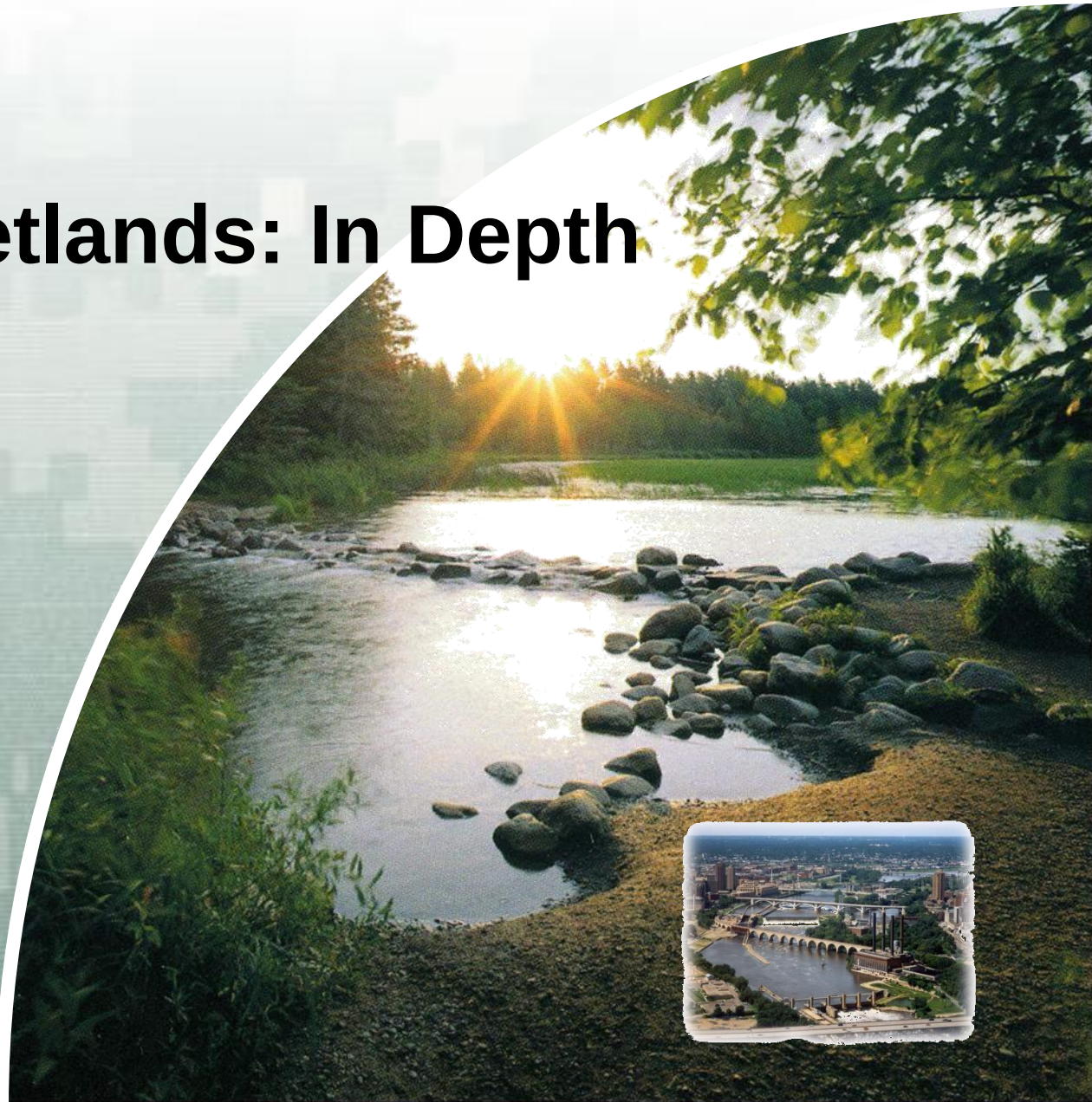
St. Paul District

October 28, 2014 – BWSR Academy



US Army Corps of Engineers

BUILDING STRONG®

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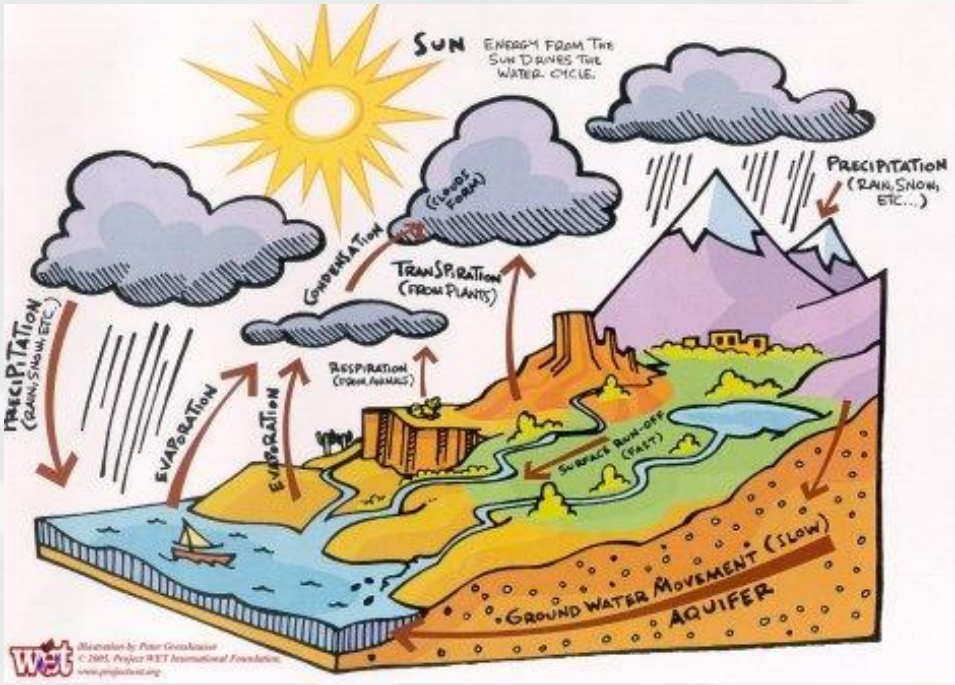
DoD Joint Ethics Regulation, ¶ 2-207

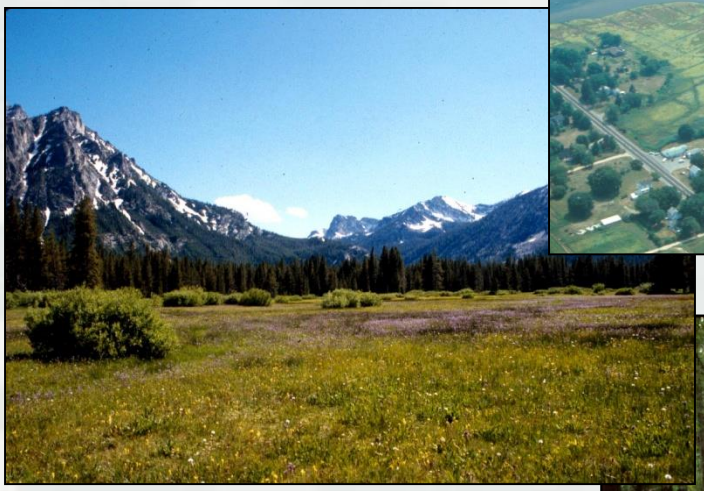
Hydrologic Landscapes

-Tom Winter, USGS

- Within similar landscapes, water moves as
  - Groundwater
  - Surface water
  - Atmospheric water
- affected by similar
  - Landform/topography
  - Soils/geology
  - Climate

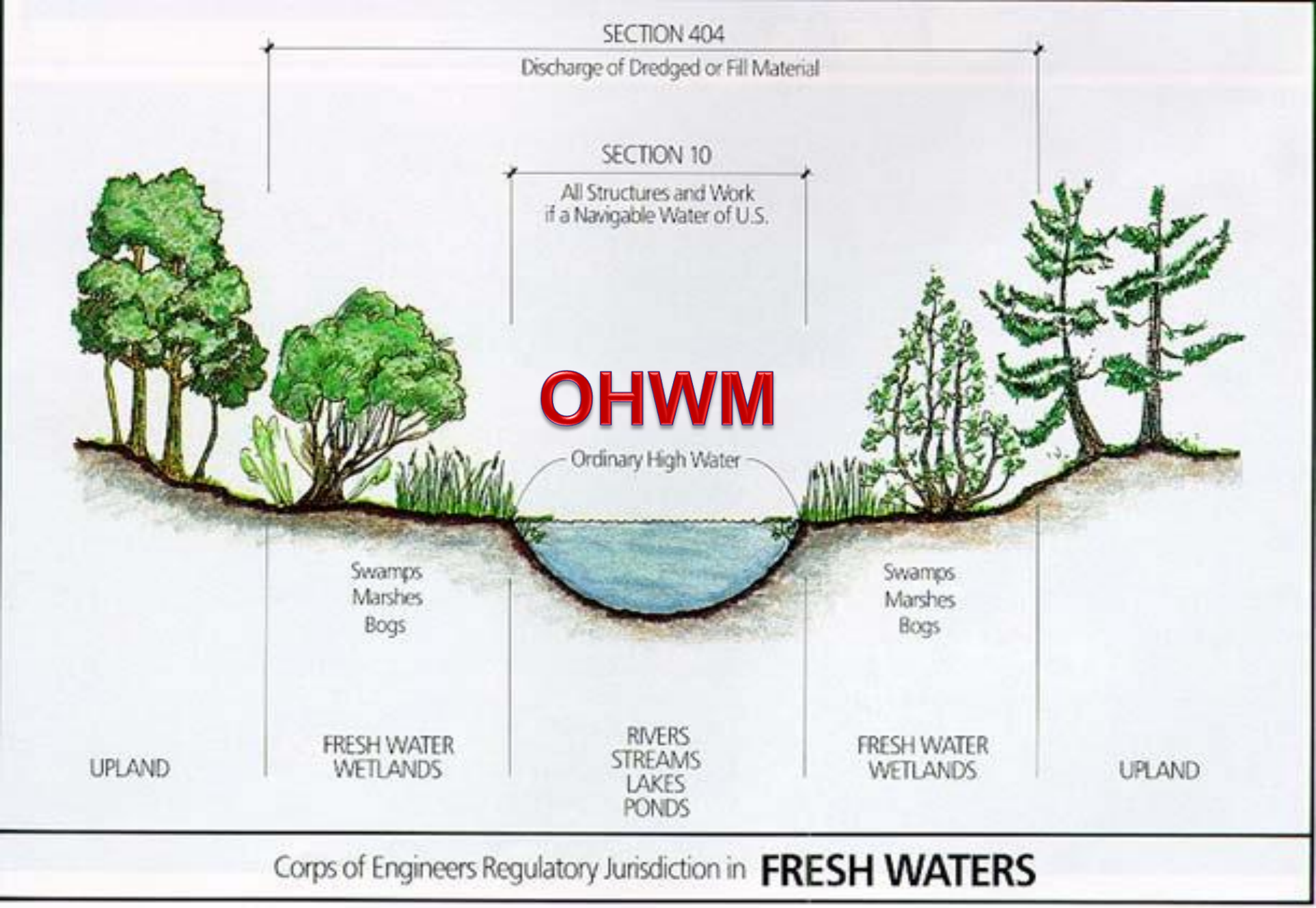




Waters of the United States (WOUS)

33 CFR 328



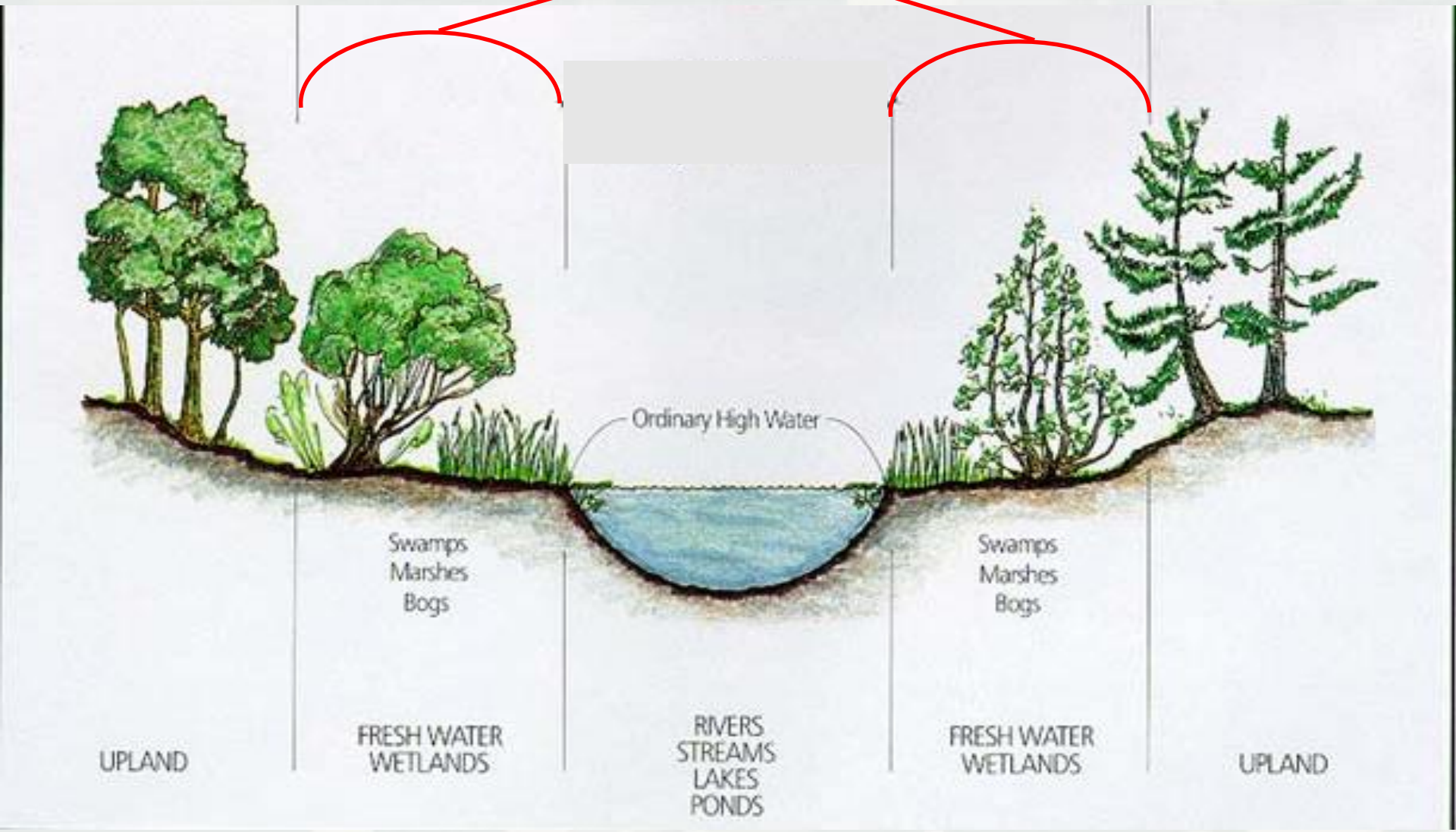
Corps of Engineers Regulatory Jurisdiction in **FRESH WATERS**

Waters of the State of Minnesota

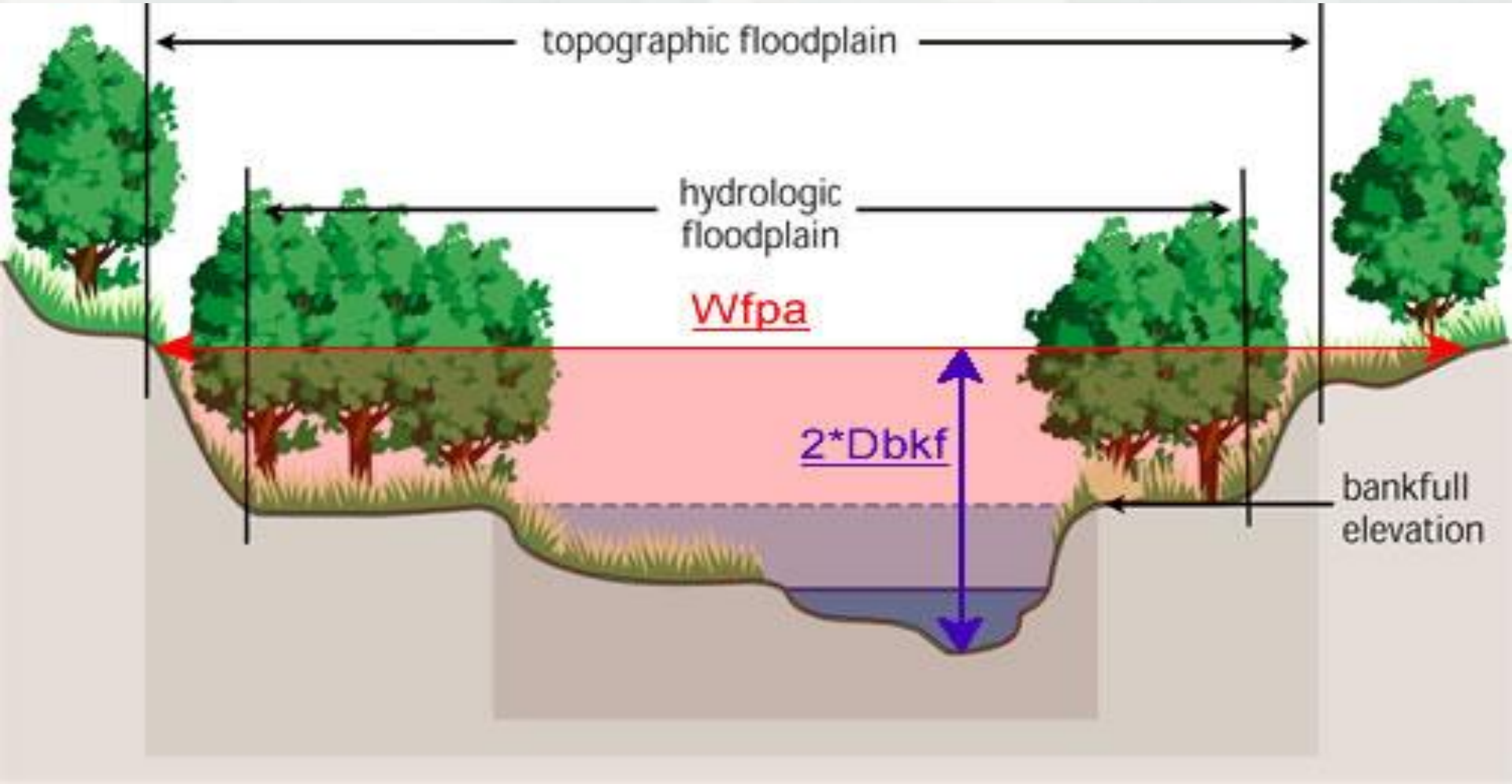
- "Waters of the state" means surface or underground waters, except surface waters that are not confined but are spread and diffused over the land. Waters of the state includes boundary and inland waters.

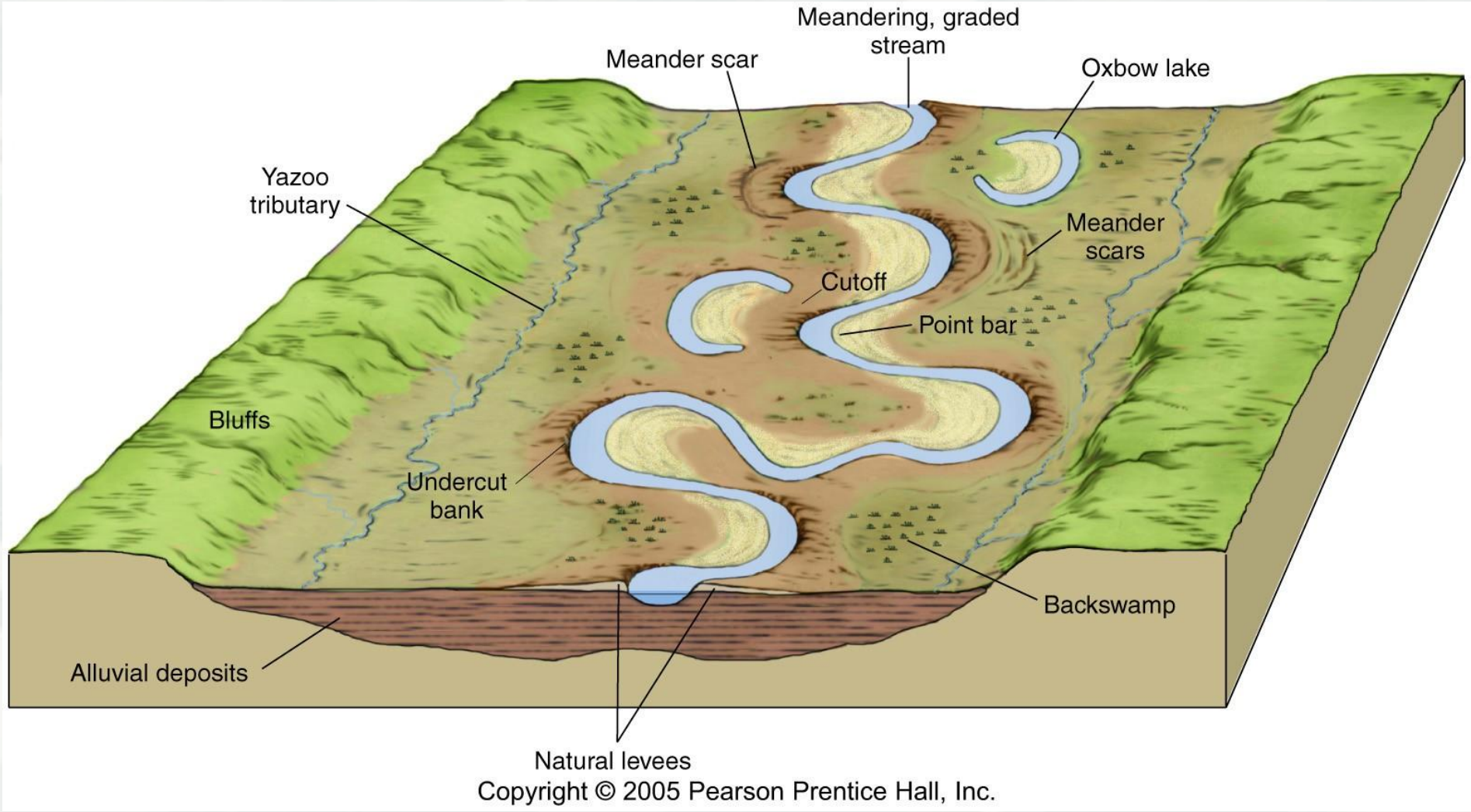
OHWL

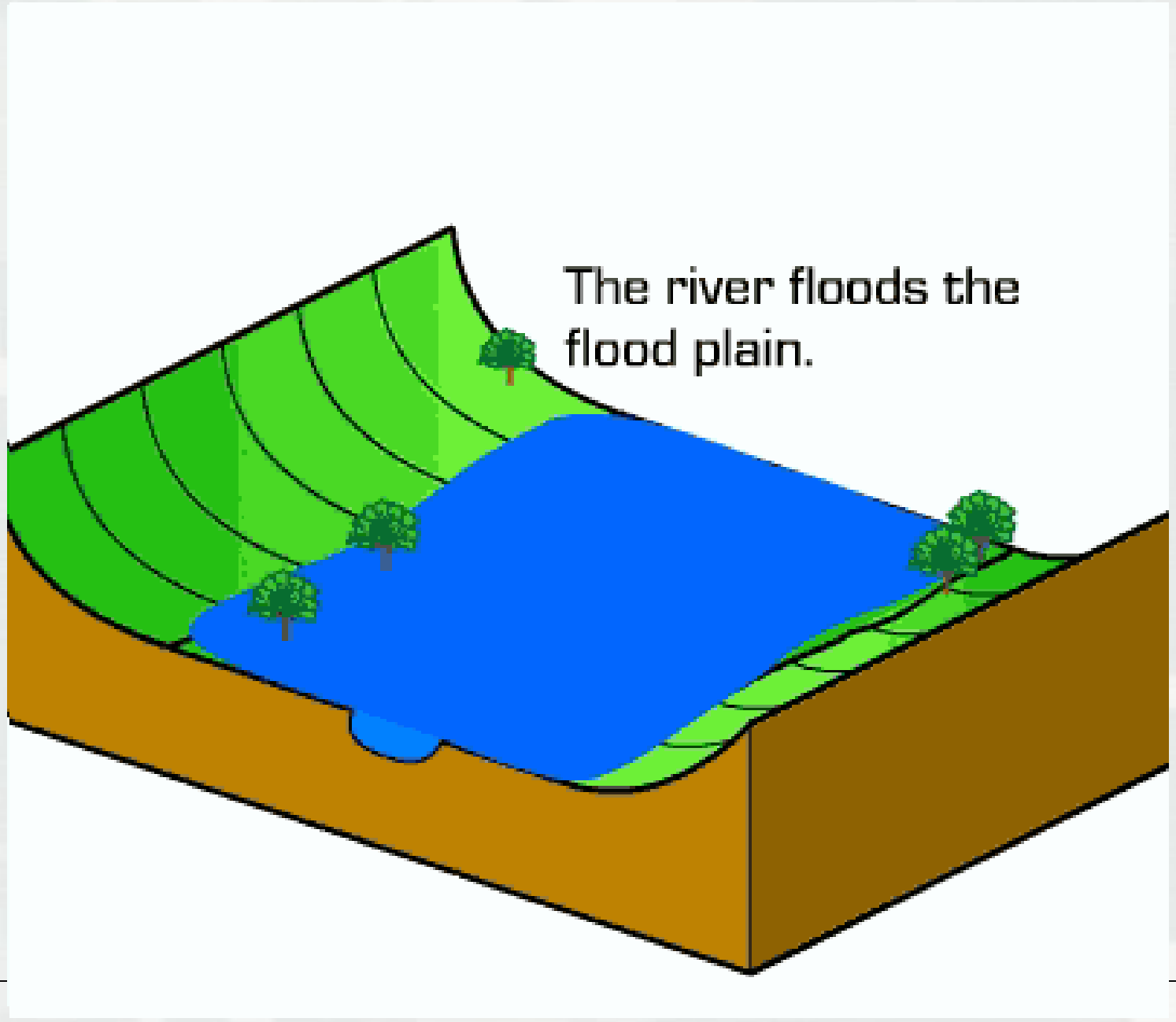
Wetland Conservation Act



- A floodplain: area of land adjacent to a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding during periods of high discharge.

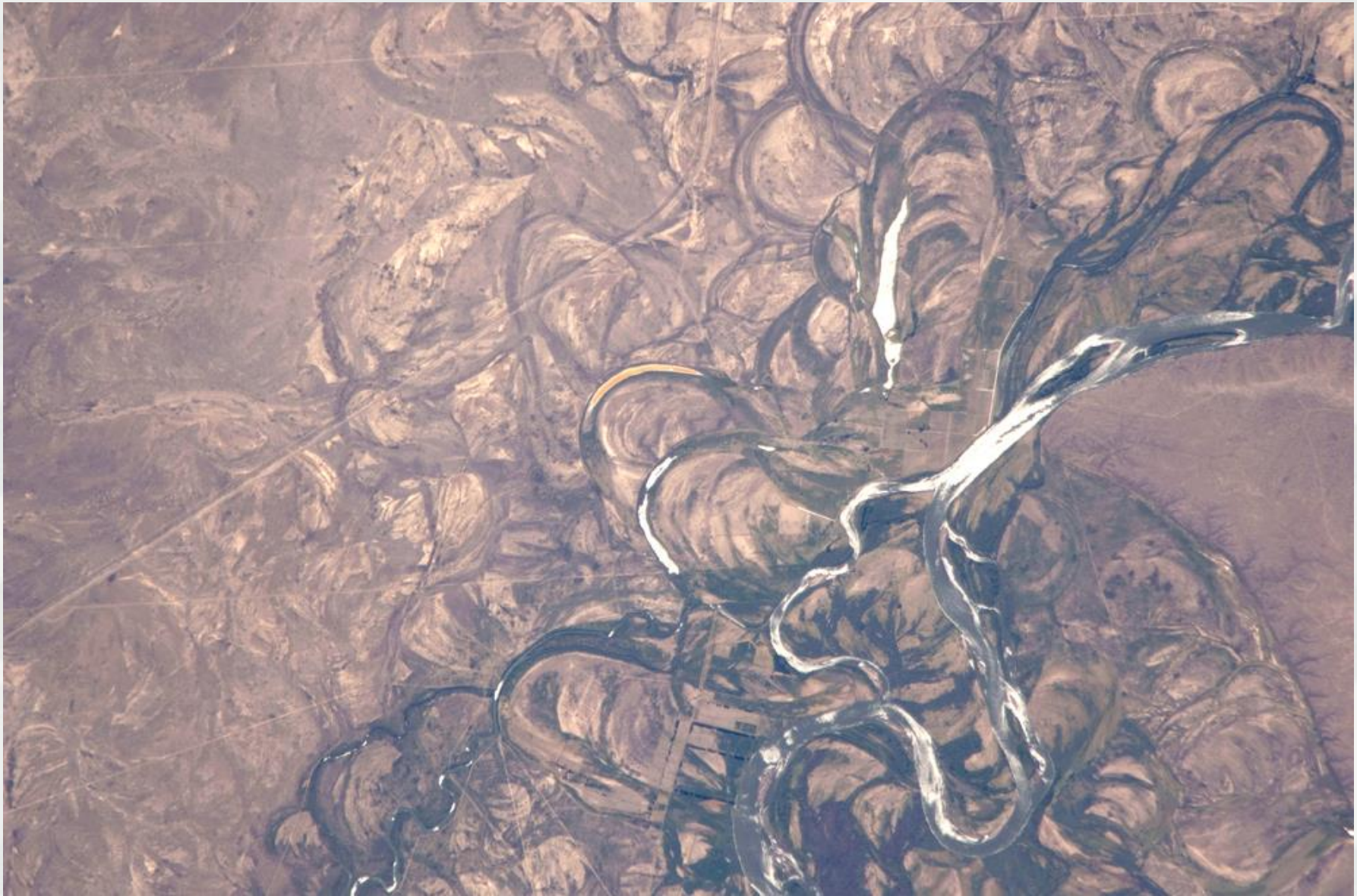




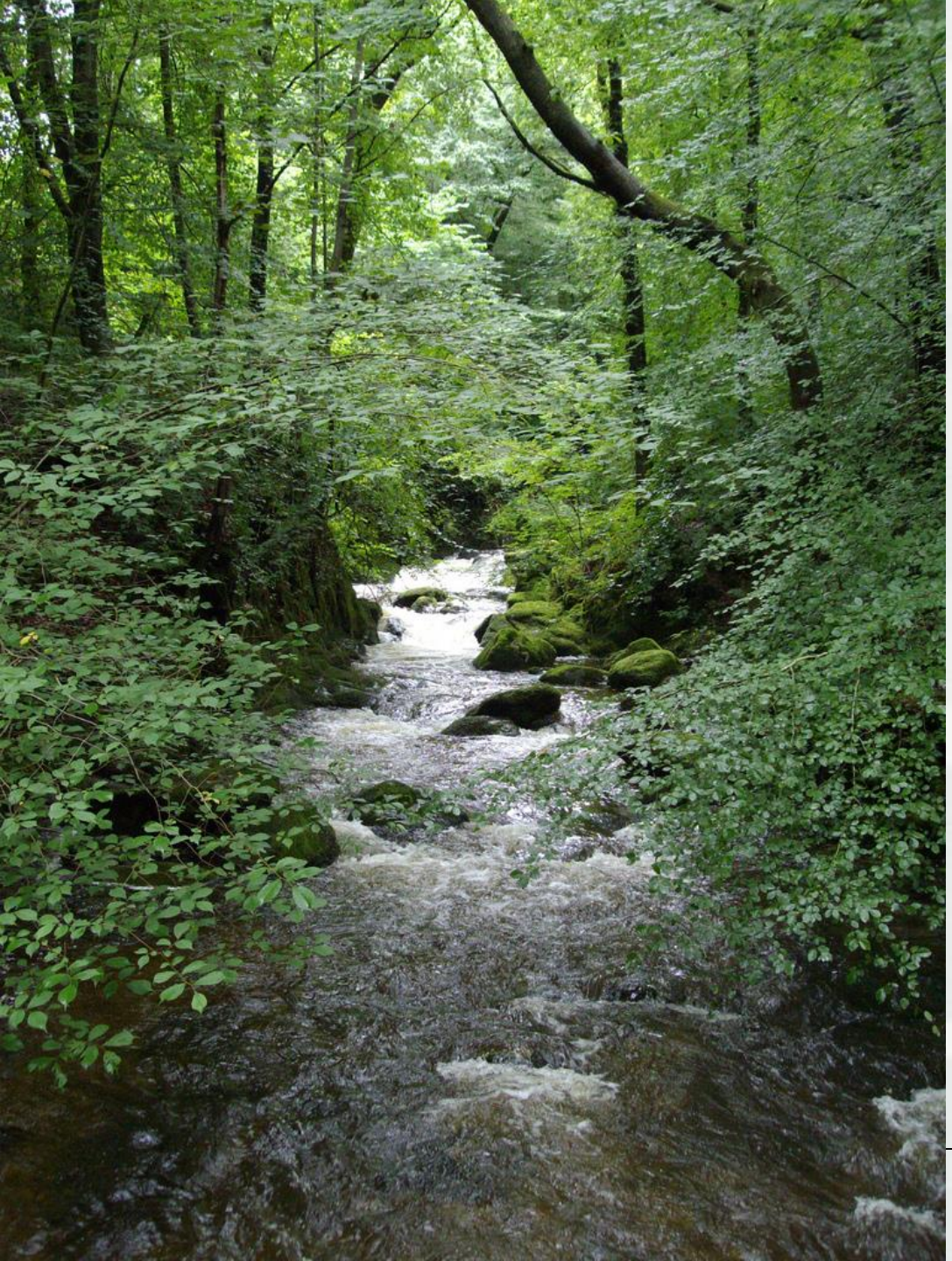

The river floods the
flood plain.

Floodplains on lakes

Floodplains are dynamic systems



Floodplains are part of high energy systems



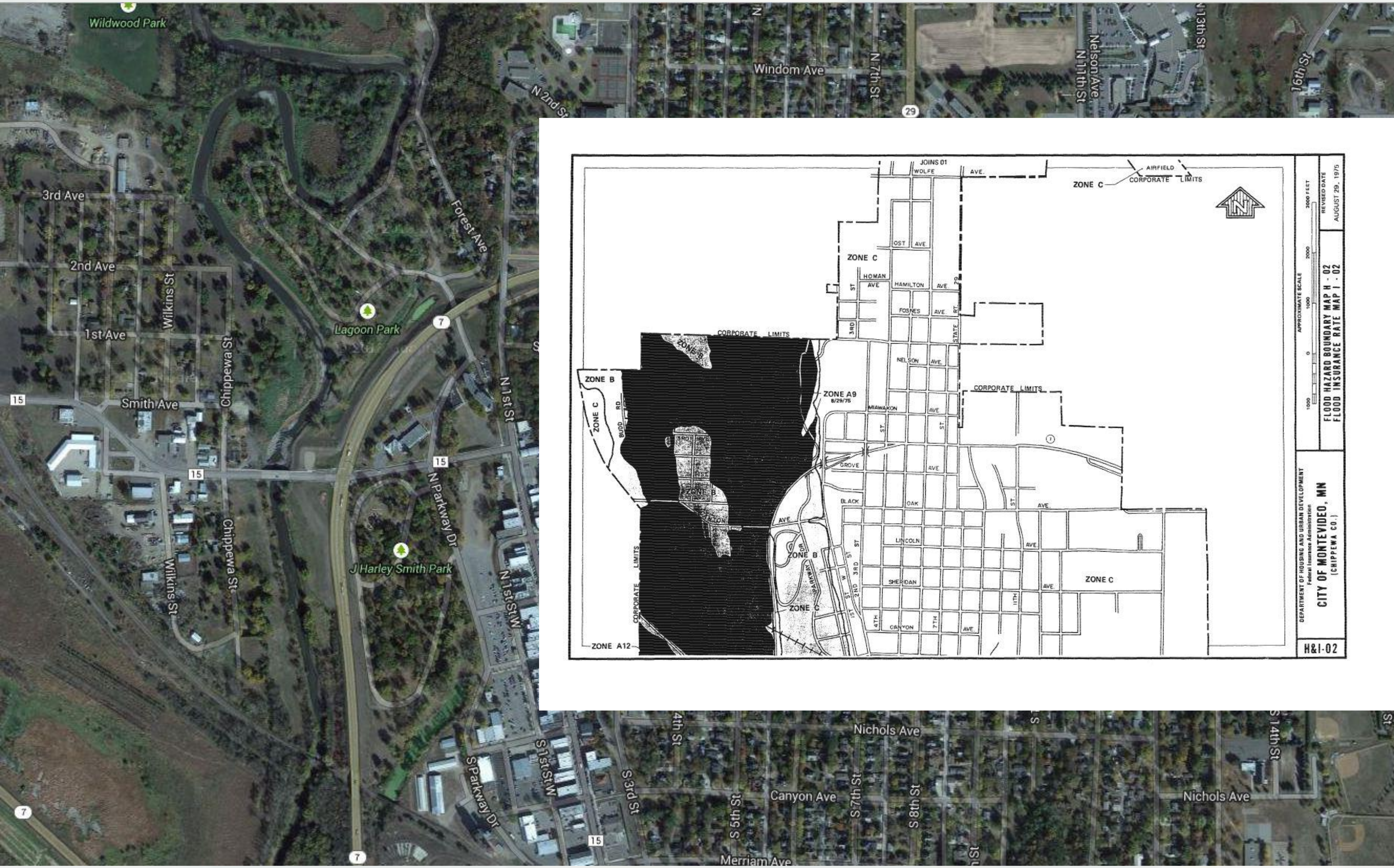
Floodplains are highly productive systems

Floodplains are highly productive

- Stream and riparian corridors are used by terrestrial fauna more than any other habitat type
- Riparian areas provide proximity to the three critical resources for wildlife: food, water and shelter/cover

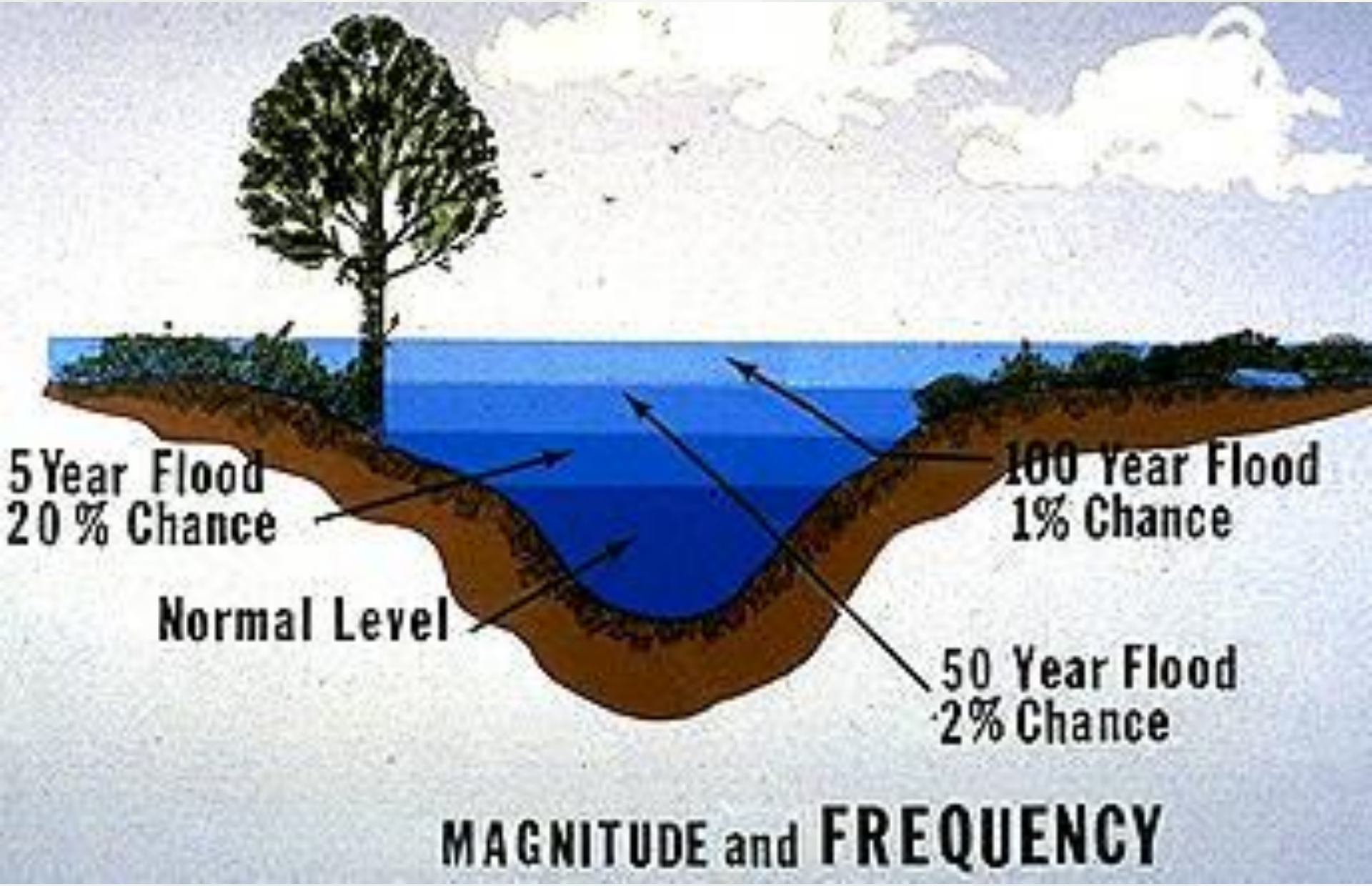
Flood Zones

- Base flood/SFHA: The flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood."
  - ► 14 different “Zones” labeled on FIRM
- Moderate flood zones: Between 100-year flood and 0.2-percent chance flood (500-yr)
  - ► Labeled “Zone B or X (shaded)” on FIRM
- Minimal flood zones: Above 500-yr flood
  - ► Labeled “Zone C or X (unshaded)” on FIRM



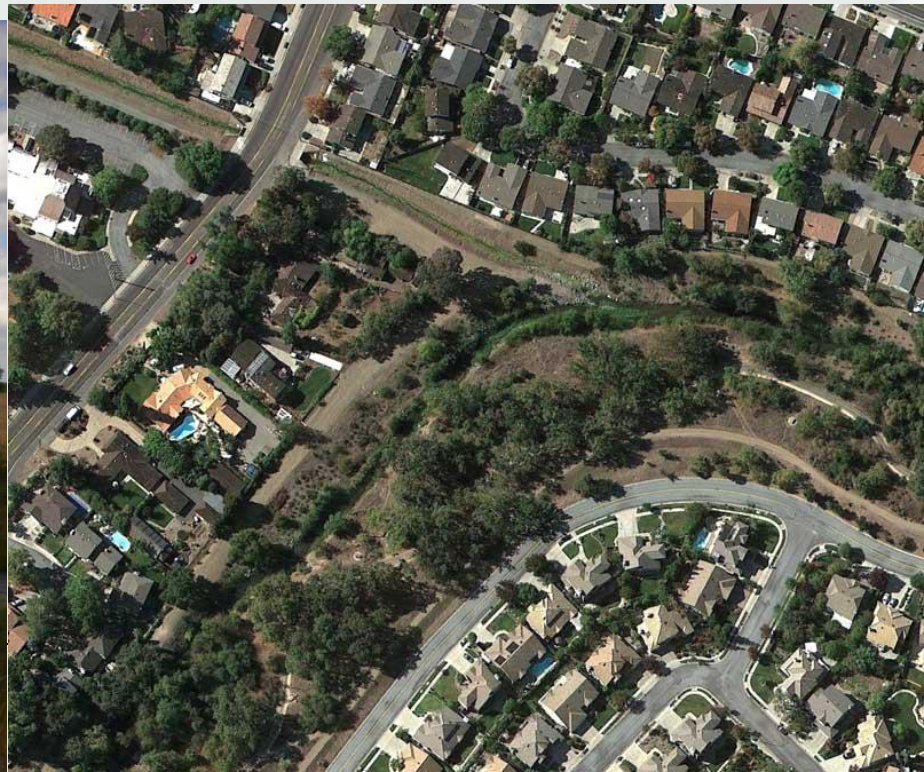
Wildwood Park
Windom Ave
N 2nd St
N 7th St
Nelson Ave
N 11th St
N 13th St
16th St
29
3rd Ave
2nd Ave
Wilkins St
Forest Ave
Lagoon Park
1st Ave
Chippewa St
Smith Ave
15
7
N 1st St
N Parkway Dr
J Harley Smith Park
N 1st St W
S 1st St W
S Parkway Dr
S 3rd St
4th St
Nichols Ave
S 5th St
Canyon Ave
S 7th St
S 8th St
S 14th St
Merriam Ave
JOINS 01
WOLFE AVE.
AIRFIELD
ZONE C
CORPORATE LIMITS
ZONE C
HOMAN AVE
HAMILTON AVE
FOSNES AVE
NELSON AVE
CORPORATE LIMITS
ZONE B
ZONE C
BUDD RD
ZONE A9
8/29/75
MIAWAKON AVE
GROVE
BLACK
OAK
AVE.
LINCOLN
ZONE B
SHERIDAN
ZONE C
CANYON
ZONE C
ZONE A12
CORPORATE LIMITS
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration
CITY OF MONTEVIDEO, MN
(CHIPPEWA CO.)
FLOOD HAZARD BOUNDARY MAP H - 02
FLOOD INSURANCE RATE MAP I - 02
APPROXIMATE SCALE
REVISED DATE
AUGUST 29, 1975
H&I-02


Floodway
100-YR
100-YR
500-YR
500-YR


5 Year Flood
20 % Chance
Normal Level
100 Year Flood
1% Chance
50 Year Flood
2% Chance
MAGNITUDE and FREQUENCY

Riparian Area

- Area of vegetation adjacent to an aquatic system.
- Many different functions.



- **Trap and remove sediment in runoff**
- **Reduce bank erosion**
- **Trap and remove nutrients such as P and N**
- **Contribute leaves and woody material to streams**
- **Store flood waters**

- **Maintain habitat for fish and wildlife**
- **Help maintain base flow in stream channels**
- **Maintain and improve the aesthetic appearance of stream and river corridors**
- **Provide opportunities for recreation**

What is a Wetland?

- “Wetlands are sometimes wet areas where people meet to argue.”
  - G. Larson

What is a Wetland?

- Technical definition:

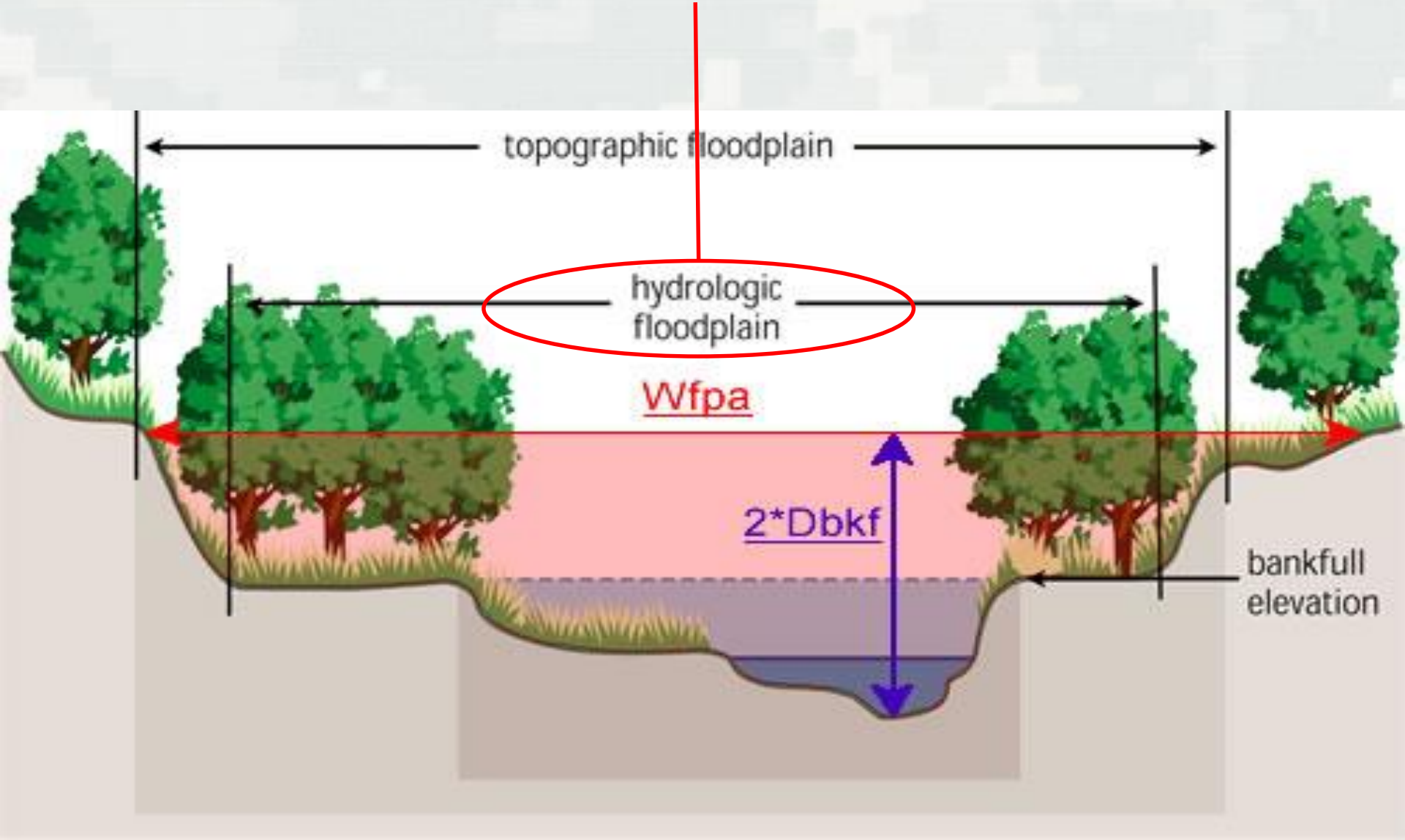
Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

What is a Wetland?

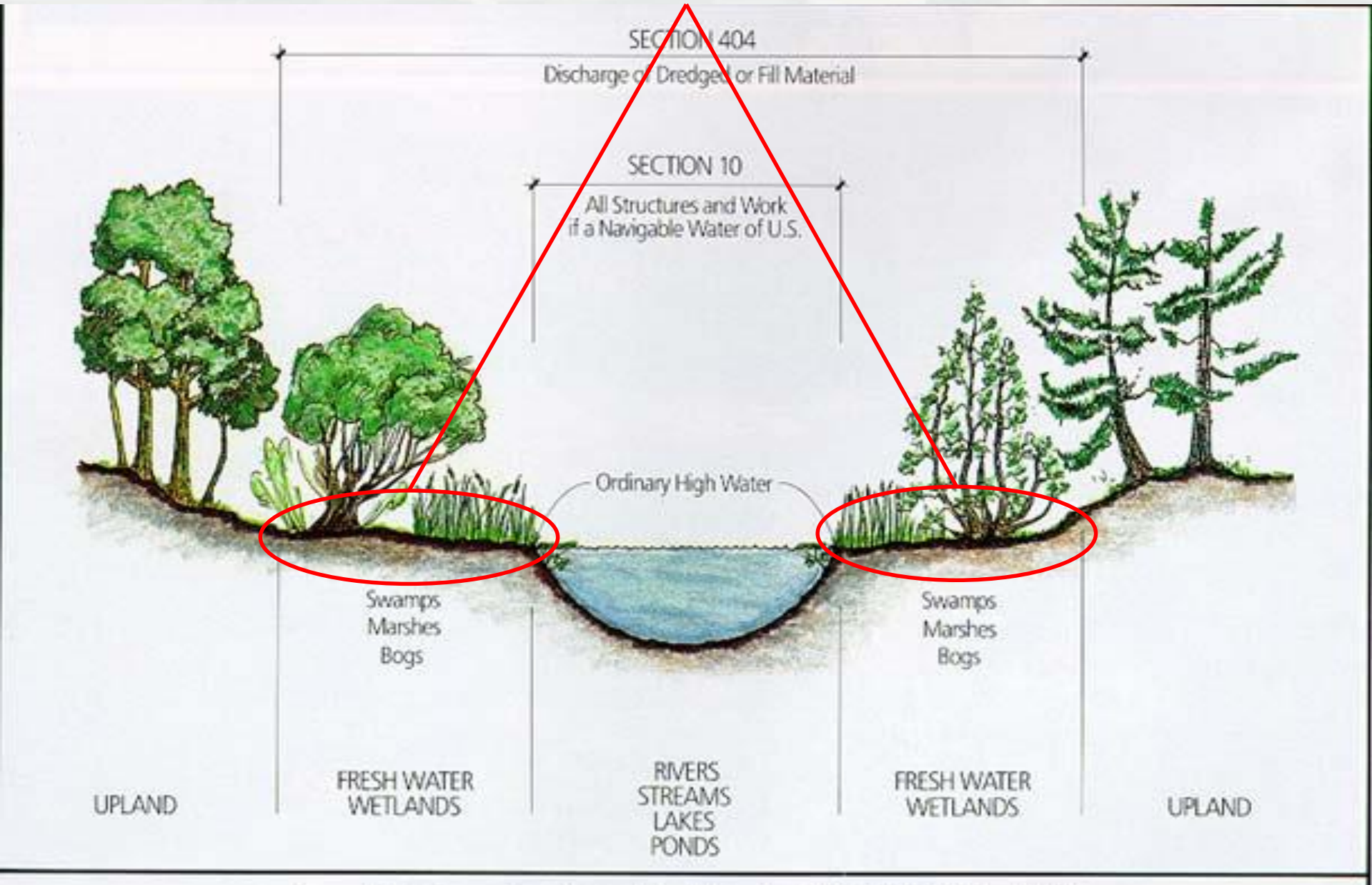
- Wetlands are transitional areas between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

WET----------LAND

Floodplain wetlands



Floodplain wetlands



US Army Corps
of Engineers
Waterways Experiment
Station

Wetlands Research Program Technical Report Y-87-1 (on-line edition)

Corps of Engineers
Wetlands Delineation Manual

by Environmental Laboratory

January 1987 - Final Report
Approved For Public Release; Distribution Is Unlimited

ERDC/EL TR-10-1

Environmental Laboratory

US Army Corps
of Engineers
Engineer Research and
Development Center

Wetlands Regulatory Assistance Program

Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)

U.S. Army Corps of Engineers

March 2010

Approved for public release; distribution is unlimited.

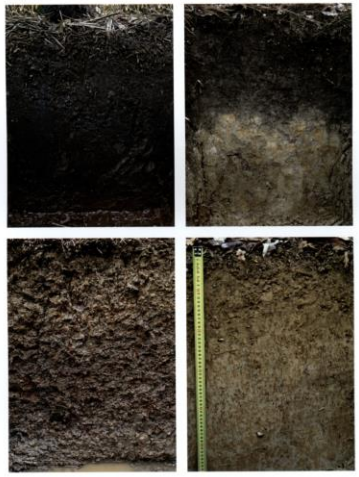
USDA United States Department of Agriculture

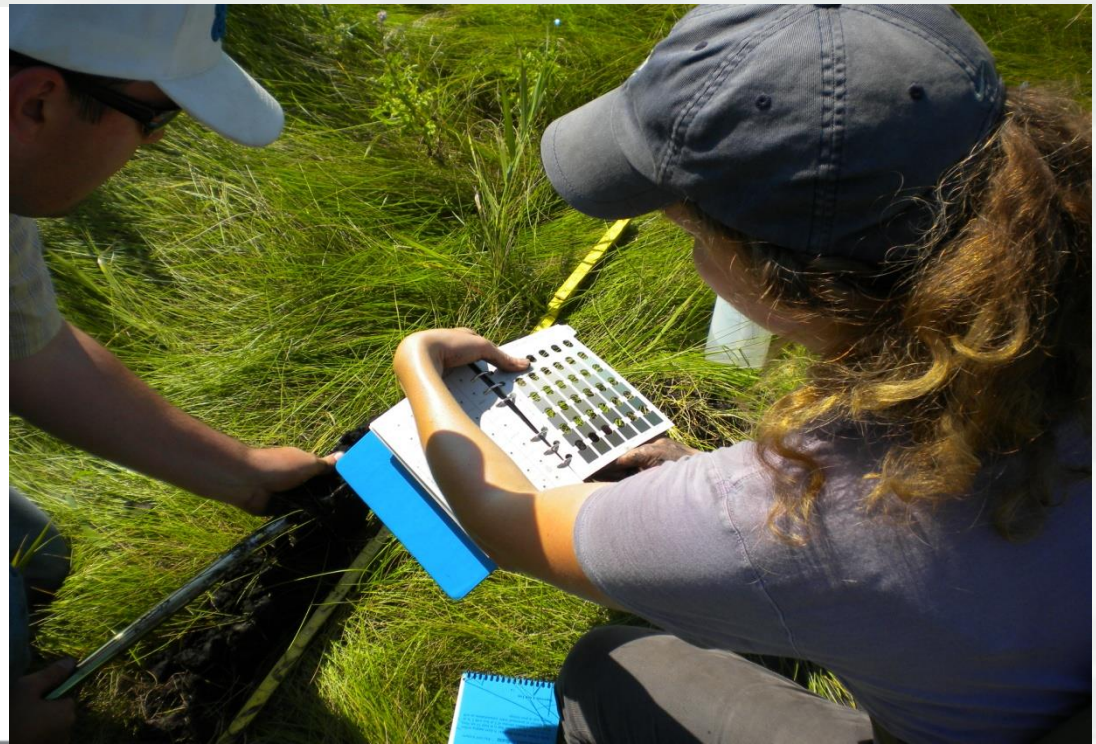
NRCS Natural Resources Conservation Service

In cooperation with the National Technical Committee for Hydric Soils

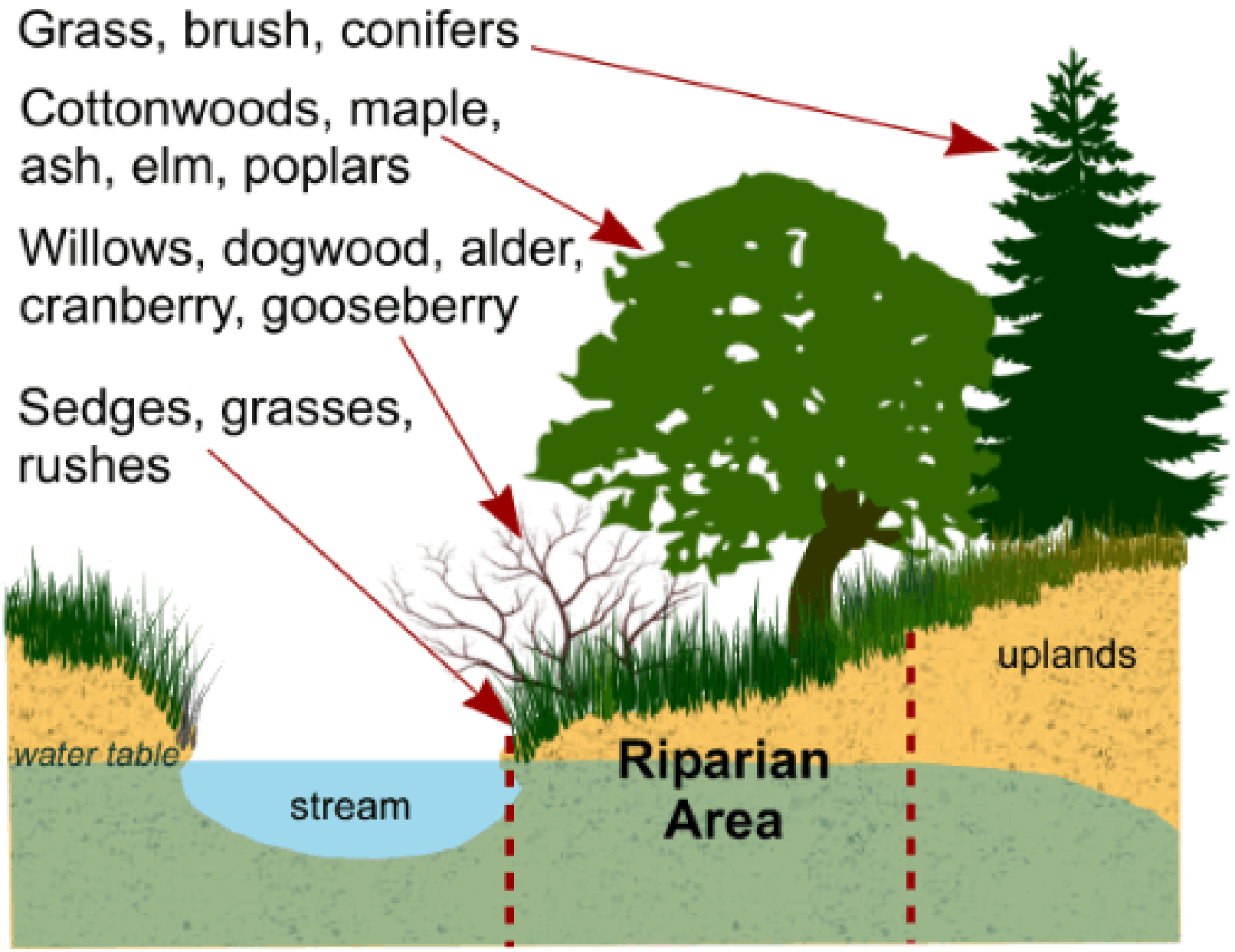
Field Indicators of Hydric Soils in the United States

A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010

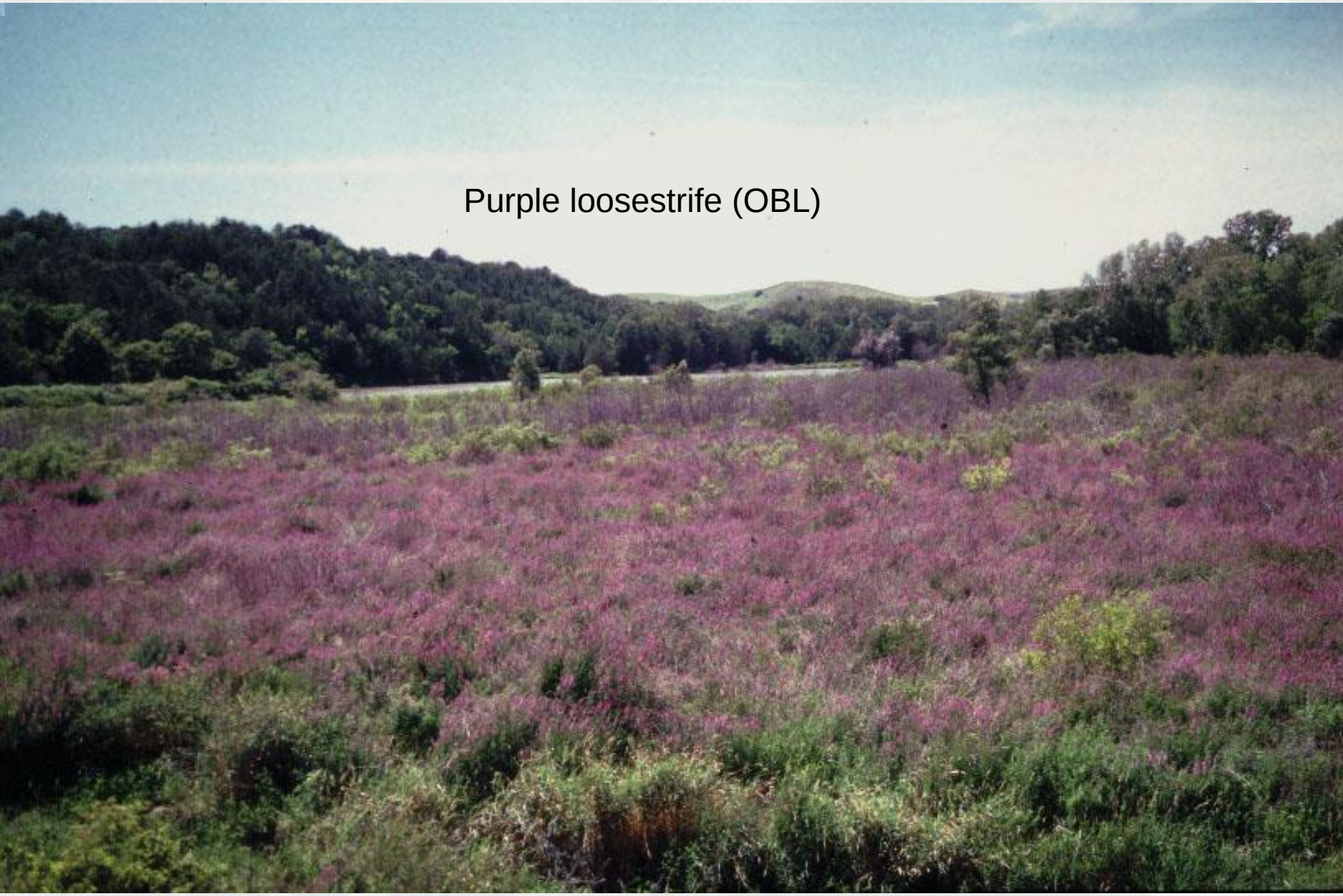




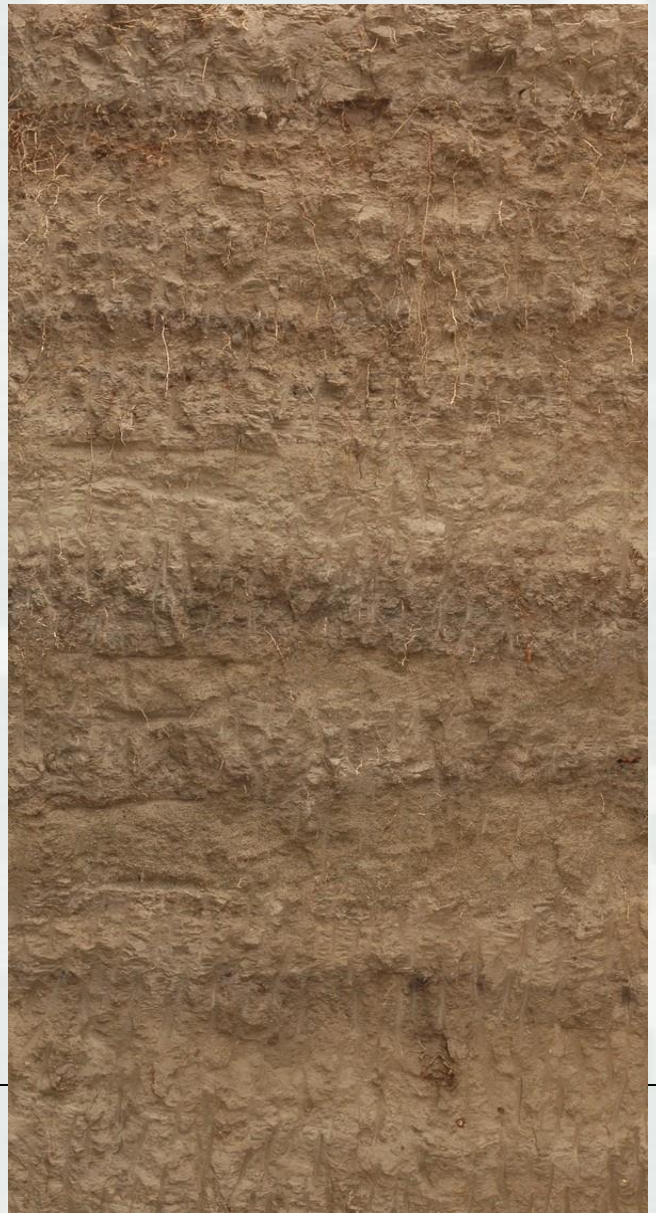

BBC

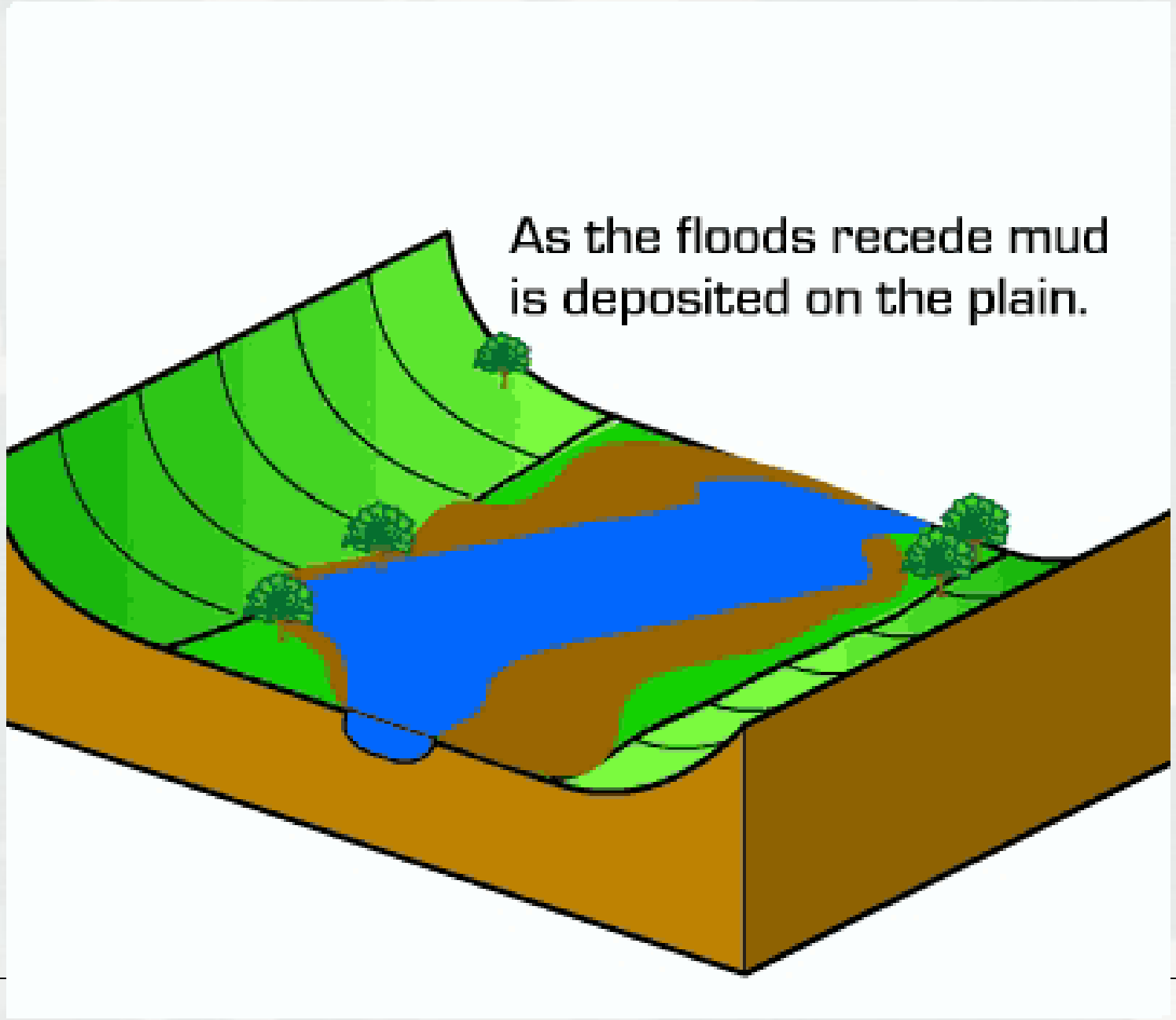

Grass, brush, conifers
Cottonwoods, maple, ash, elm, poplars
Willows, dogwood, alder, cranberry, gooseberry
Sedges, grasses, rushes
water table
stream
Riparian Area
uplands

Typical dominants in MN forested floodplain :
Silver maple (FACW)
Cottonwood (FAC)
Green ash (FACW)
Box elder (FAC)
White grass (FACW)
Reed canary grass (FACW)
Wood nettle (FACW)
Common buckthorn (FAC)
Glossy buckthorn (FACW)


Purple loosestrife (OBL)

Floodplain Soils




As the floods recede mud
is deposited on the plain.

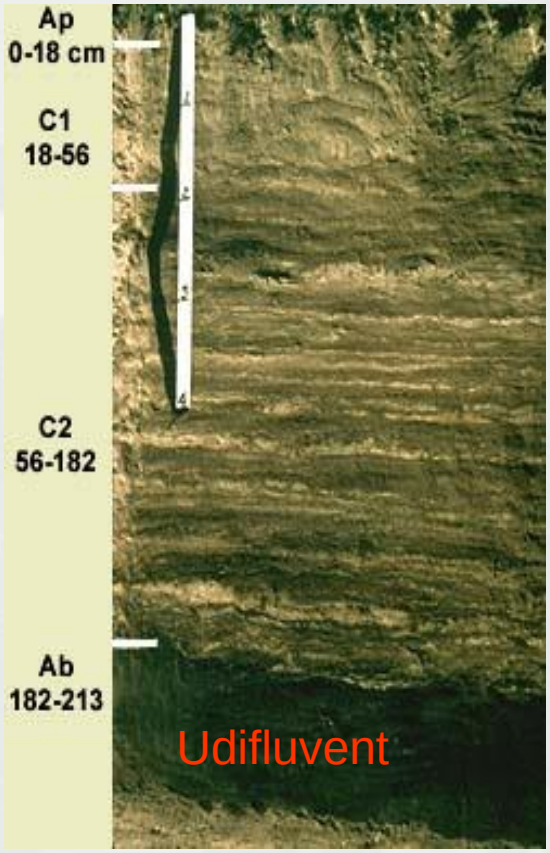
Entisols

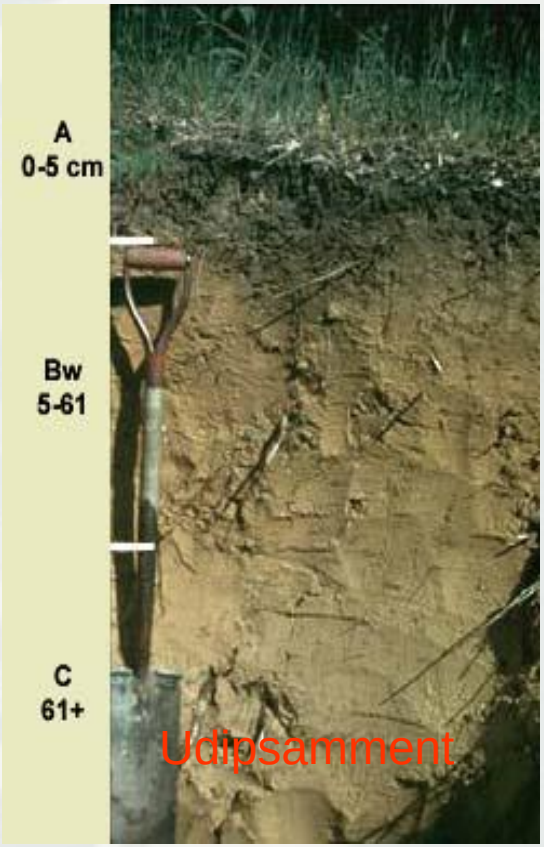
- Entisols are
  - ► mineral soils
  - ► no, or little, development of pedogenic horizons
  - ► young soils on unstable landscapes
    - e.g. floodplains

Entisol Factors are...

- Any climate
- Parent material varies
  - many are sandy
  - variety of textures on floodplains
- Any vegetation
- Relatively young soils
  - exception - sandy PM
- Topography varies
  - floodplains to sand dunes
- Virtual lack of horizons

Entisols - Two Divisions





- Fluvents and Fluvaquents - mostly loamy and clayey
- Psamments and Psammaquents - sandy texture

Fluvaquents

- May have to rely on evidence of flooding
  - stratifications
  - hydrologic indicators
  - data

Fluvial sediments

F.I. A5 – Stratified Layers

1860—Comfrey silt loam, channeled

Cumulic Endoaquoll

Map Unit Setting

Elevation: 400 to 1,500 feet
Mean annual precipitation: 30 to 38 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 145 to 205 days

Map Unit Composition

Comfrey, channeled, frequently flooded, and similar soils: 95 percent

Description of Comfrey, Channeled, Frequently Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water capacity: High (about 11.2 inches)

Interpretive groups

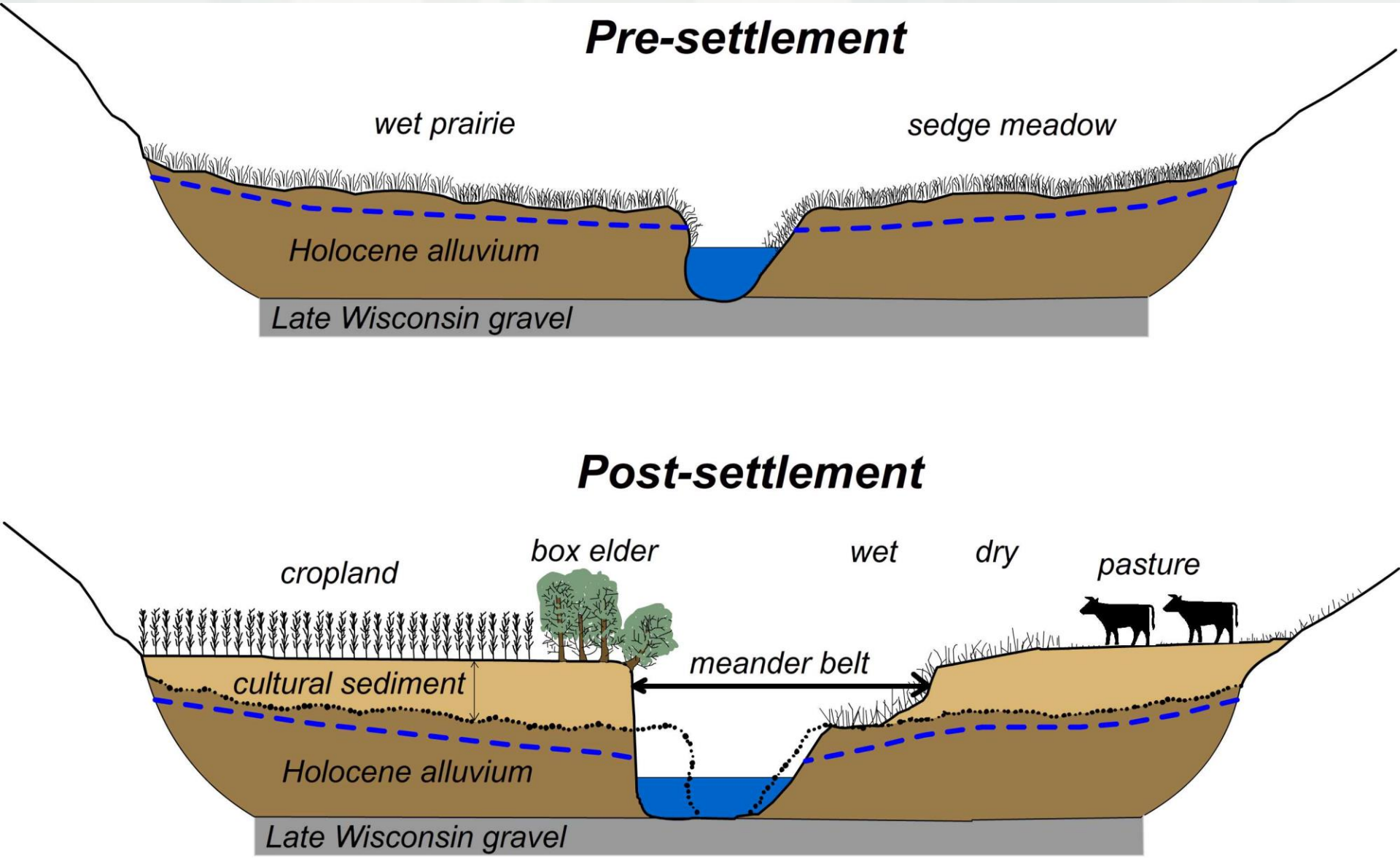
Farmland classification: Not prime farmland
Land capability (nonirrigated): 6w
Hydrologic Soil Group: B/D

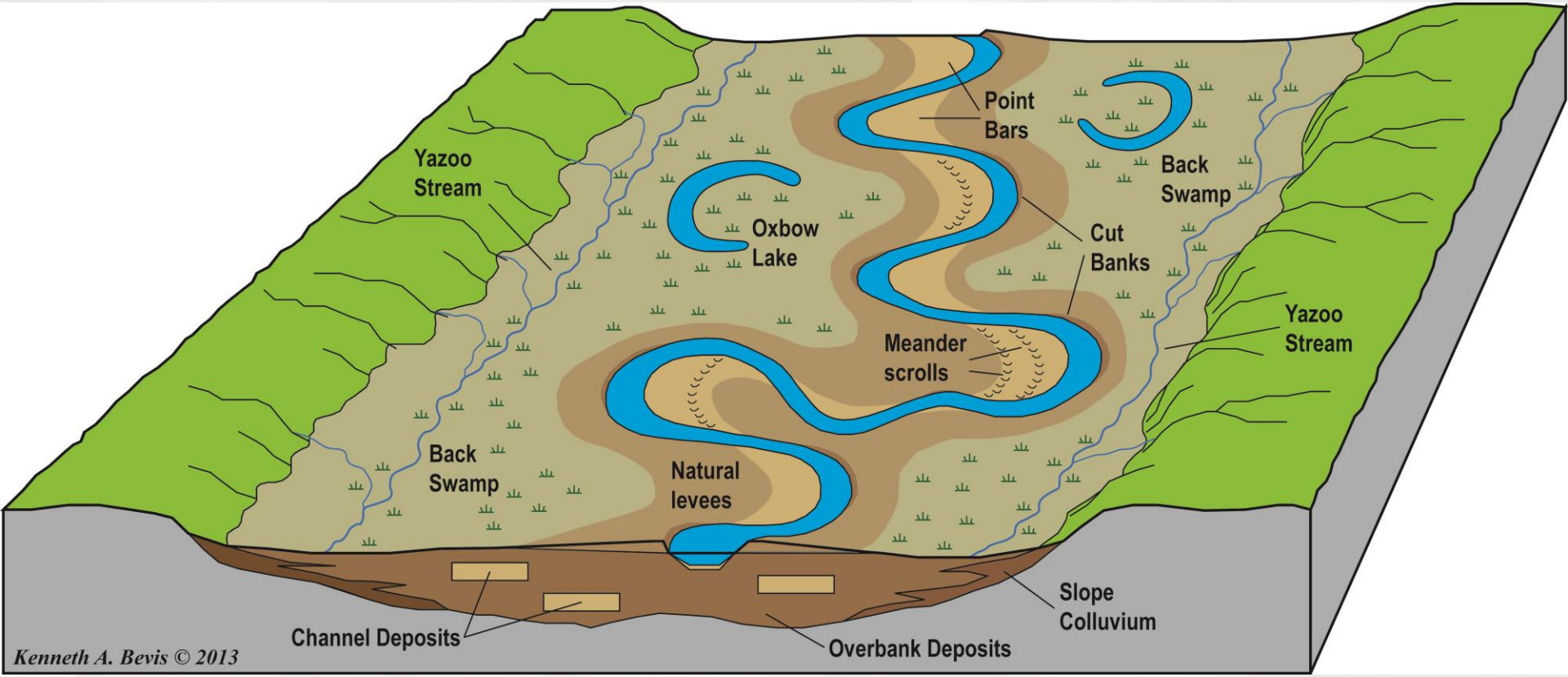
F.I. F6 – Redox Dark Surface

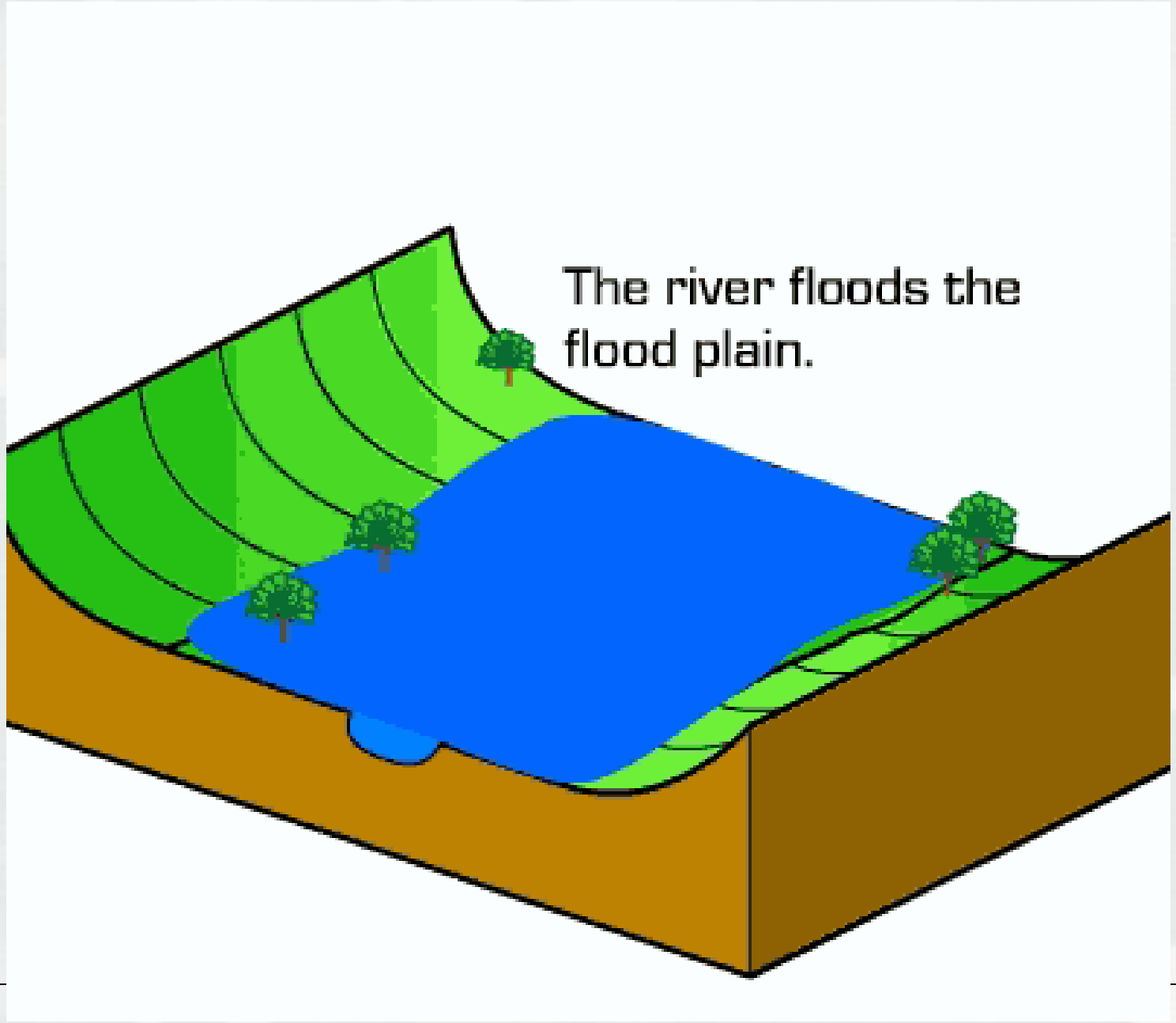
Typical profile

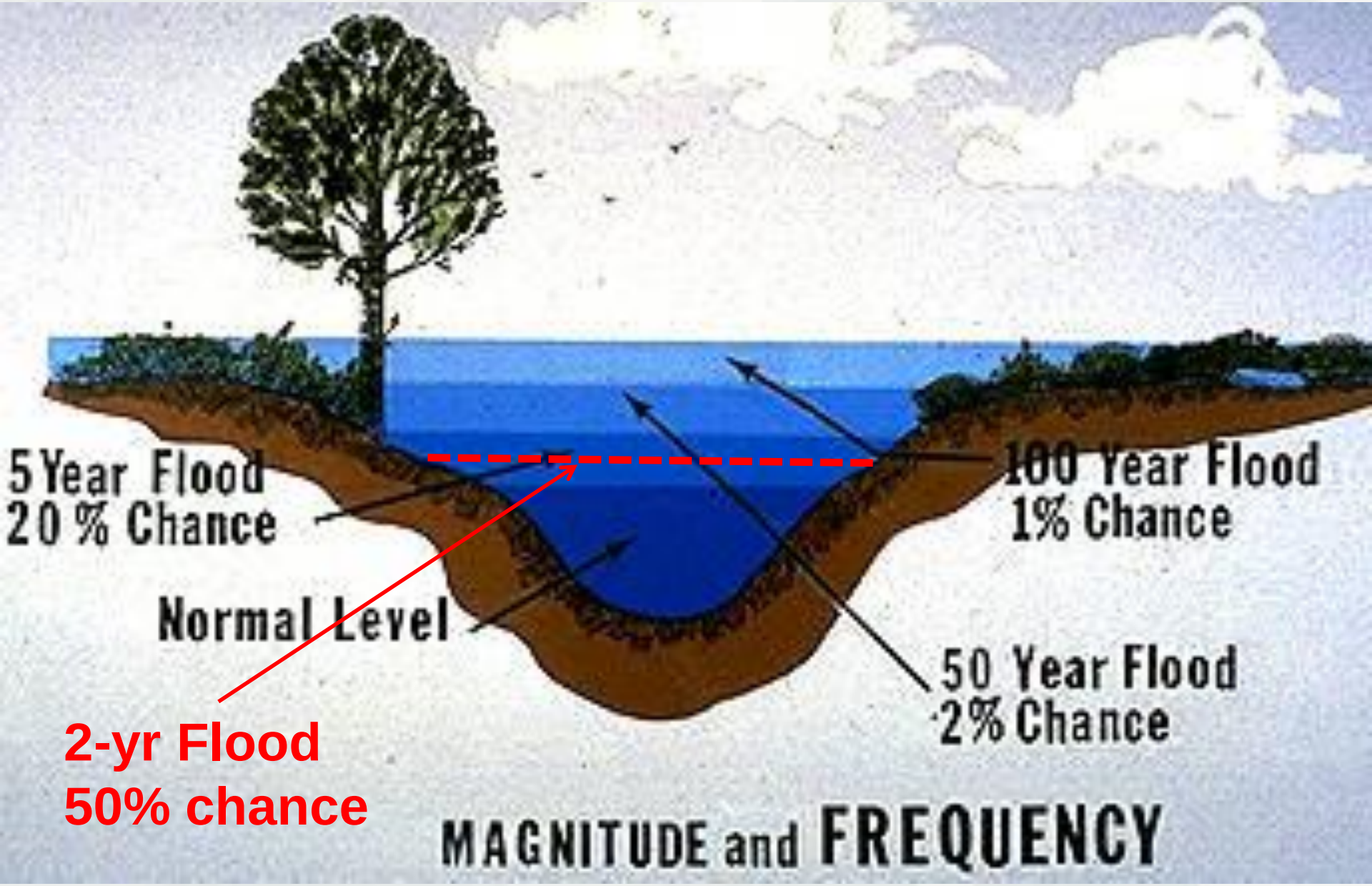
0 to 12 inches: Silt loam
12 to 60 inches: Clay loam

0-2”: 10YR 2/1
2-18” 10YR 3/1 with 15% 7.5YR 4/6 redox


Pre-settlement
wet prairie
sedge meadow
Holocene alluvium
Late Wisconsin gravel
Post-settlement
cropland
box elder
wet
dry
pasture
meander belt
cultural sediment
Holocene alluvium
Late Wisconsin gravel


Yazoo
Stream
Point
Bars
Back
Swamp
Oxbow
Lake
Cut
Banks
Yazoo
Stream
Meander
scrolls
Back
Swamp
Natural
levees
Slope
Colluvium
Channel Deposits
Overbank Deposits
Kenneth A. Bevis © 2013

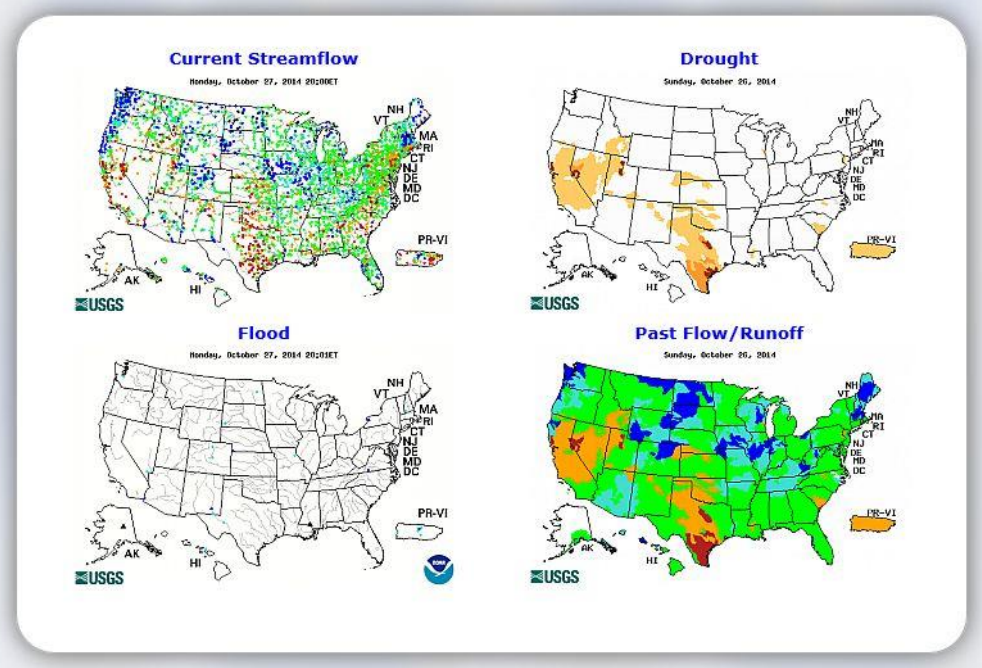

The river floods the
flood plain.


5 Year Flood
20 % Chance
Normal Level
100 Year Flood
1% Chance
50 Year Flood
2% Chance
2-yr Flood
50% chance
MAGNITUDE and FREQUENCY

USGS
science for a changing world

WaterWatch

- Home
- Current Streamflow
- Flood
- Drought
- Past Flow/Runoff
- Animation
- Toolkit
- Annual Summaries
- Additional Information
- About WaterWatch



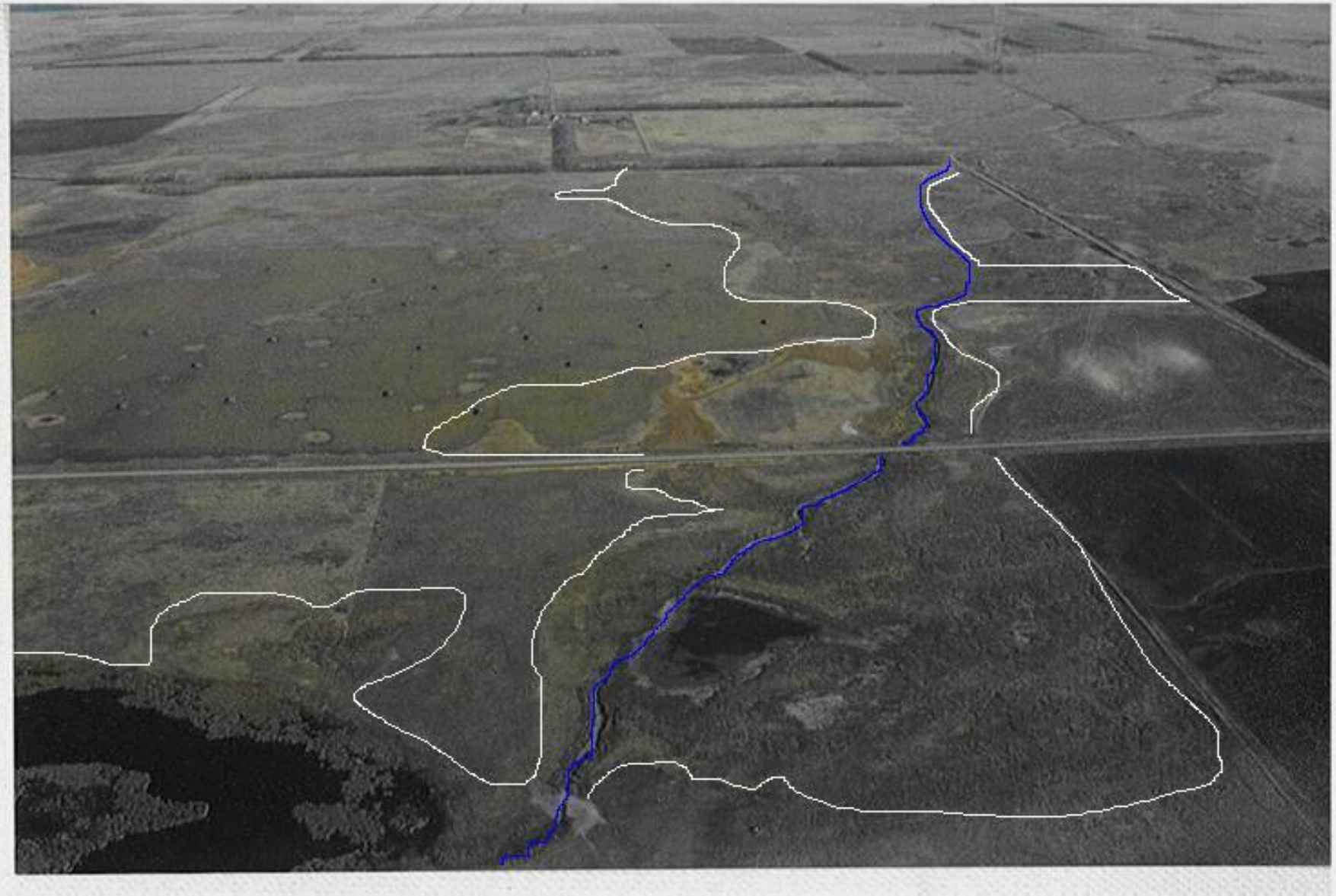
waterwatch.usgs.gov

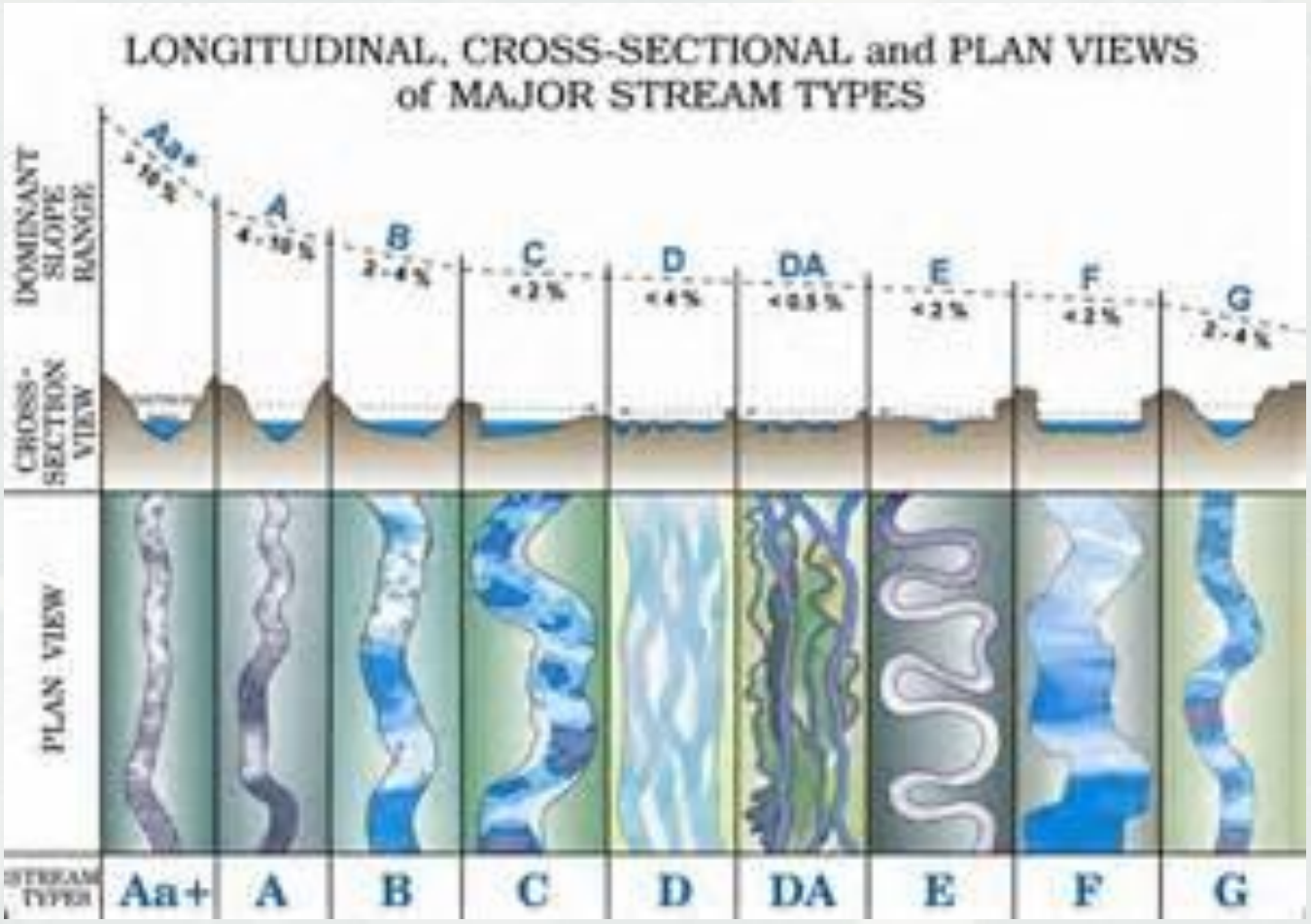
Typical floodplain hydrology indicators

What about the streams?

Intermittent stream vs. wetlands

Streams & Wetlands




LONGITUDINAL, CROSS-SECTIONAL and PLAN VIEWS
of MAJOR STREAM TYPES
DOMINANT SLOPE RANGE
CROSS-SECTION VIEW
PLAN VIEW
STREAM TYPES
Aa+
A
B
C
D
DA
E
F
G

Winona Riverfront Delineation

Winona Riverfront Delineation

Map Unit Legend

Hydric rating by map unit(5 categories)–Winona County, Minnesota			
Mapunit symbol	Map symbol and map unit name	Hydric Percent of map unit	Hydric category
1015	1015—Psamments, fill	0	Nonhydric
1860	1860—Comfrey silt loam, channeled	95	Predominantly hydric
W	W—Water	0	Nonhydric

Winona Riverfront Delineation

Winona Riverfront Delineation

Sandy fill

Berm

Regulatory Mission

To protect the Nation's aquatic resources, while allowing reasonable development through fair and balanced decisions.

Regulatory Authority

Section 10 - Rivers and Harbors Act of 1899

Regulatory Authority

Section 404 Clean Water Act, 1972 & 1977


SPEED LIMIT
25

June 1969